IN THE SPECIFICATION

Please replace paragraph [0016] with the following amended paragraph:

[0016] Variable-reflective tunable optical filter 102 comprises a Sagnac interferometer 110 including 50/50 coupler 117 to direct half of the incoming light in each direction around the Sagnac interferometer 110 and optical waveguide grating 111 to reflect specific wavelength channels of the input WDM data stream. Variable-reflective tunable optical filter 102 also comprises a wavelength/frequency adjustment circuit 113 to adjust or tune the reflection band of optical waveguide grating 111. For one embodiment of variable-reflective tunable optical filter 102, wavelength/frequency adjustment circuit 113 may comprise heaters to thermo-optically tune the reflection band of optical waveguide grating 111. For an alternative embodiment, wavelength/frequency adjustment circuit 113 may comprise a piezoelectric material for stress-optical tuning.

Please replace paragraph [0017] with the following amended paragraph:

[0017] The wave length reflected by optical waveguide grating 111 is substantially equal to twice the product of the grating spacing times the effective index of refraction, the effective index of refraction being a weighted combination of the core's index of refraction and the cladding's index of refraction. For one alternative embodiment of variable-reflective tunable optical filter 102, wavelength/frequency adjustment circuit 113 may change the effective index of refraction by changing the index of refraction of the core and/or the index of refraction of the cladding to tune the reflection band of optical waveguide grating 111

Please replace paragraph [0031] with the following amended paragraph:

[0031] Figure 3b illustrates a flow diagrams for an alternative embodiment of a process 302 to perform hitless tuning of a variable-reflective tunable optical filter in accordance with Figure 2. In processing block 311, a determination is made whether a new wavelength is to be tuned. If not processing continues in processing block 311. Otherwise processing proceeds to processing block 322 where a phase is adjusted in an interferometer to reduce the power of a dropped signal output. It will be appreciated that some embodiments of phase adjustment circuits may also benefit from automated correction through feedback, for example, or from pre-training to selected adjustment levels. Processing then proceeds to processing block 323 where a waveguide reflection band is adjusted to select a wavelength for a new dropped signal. In processing block 314, a determination is made whether tuning to the desired wavelength is finished. If not processing continues in processing block 323. Otherwise processing proceeds to processing block 325 where the phase is adjusted in said interferometer to increase the power of the dropped signal output. <u>For one embodiment of processing block 325, the phase may be adjusted by effectively placing a waveguide grating approximately one eighth of grating spacing off of center (approximately 50 nm to 90 nm may be effective in the shorter wavelengths of infrared, for example) in a Sagnac interferometer to cause interference of a second type at the coupler.</u> Processing then proceeds to processing block 311.

Please replace paragraph [0035] with the following amended paragraph:

[0035] Variable-reflective tunable optical filter 402 comprises an interferometer 410 including 50/50 coupler 417 and optical waveguide grating 411. Variable-reflective tunable optical filter 402 also comprises a wavelength<u>/frequency</u> adjustment circuit 413 to

tune the reflection band of optical waveguide grating 411. One embodiment of variable-reflective tunable optical filter 402 is a planar lightwave circuit containing a Sagnac interferometer 410 wherein waveguide grating 411 is a Bragg grating that is written into interferometer 110 at a position substantially equidistant in both directions from coupler 417.

Please replace paragraph [0041] with the following amended paragraph:

[0041] It will be appreciated that variable-reflective tunable optical filter 402 may provide continuously tunable filtering and hitless optical add-drop multiplexing without requiring a variety of separate devices, such as VOAs and optical switches. It will further be appreciated that wavelength/frequency adjustment circuit 413 and phase adjustment circuit 415 may be implemented using substantially the same technologies, therefore simplifying control circuitry

Please replace paragraph [0042] with the following amended paragraph:

[0042] Figure 4b illustrate another alternative embodiment of a variable-reflective tunable optical filter 404 in an OADM 403. OADM 403 comprises In port 412, Express port 414, Add port 416, and Drop port 418. OADM 401 also comprises optical circulators 419 and 420. Variable-reflective tunable optical filter 404 comprises an interferometer 430 including 50/50 coupler 417 and optical waveguide grating 421. Variable-reflective tunable optical filter 404 also comprises a wavelength/frequency adjustment circuit 423 to tune the reflection band of optical waveguide grating 421 and a phase adjustment circuit 425 to adjust the phase of at least one of the two halves of a reflected wavelength channel to interfere with each other at coupler 417.

Please replace paragraph [0047] with the following amended paragraph:

[0047] Figure 5a illustrates another alternative embodiment of variable-reflective tunable optical filters in OADM 501. OADM 501 comprises In port 512 to receive an input WDM data stream including a spectrum of wavelength channels; Express port 574 to output an express WDM data stream including the spectrum of wavelength channels; Add ports 516, 536, 556 and 576; and Drop ports 518, 538, 558 and 578 each to output dropped signals of specific wavelength channels. OADM 501 also comprises optical circulators 519, 520, 539, 540, 559, 560, 579 and 580. In each of interferometers 510, 530, 550 and 570, the reflective bands of optical waveguide gratings 511, 531, 551 and 571 may be independently tuned by wavelength/<u>frequency</u> adjustment circuits 513, 533, 553 and 573 respectively; and the phase of at least one of the two halves of each reflected wavelength channel can be adjusted by phase adjustment circuits 515, 535, 555 and 575 to interfere with each other at couplers 517, 537, 557 and 575 respectively. The output WDM data stream from optical circulator 519 is routed to In port 532 of optical circulators 539. Similarly, the ouput WDM data stream from optical circulator 539 is routed to In port 552 of optical circulators 559 and the ouput WDM data stream from optical circulator 559 is routed to In port 572 of optical circulators 579. Thus the variable-reflective tunable optical filters are connected serially to provide hitless tunable adding/dropping of four wavelength channels to/from the WDM data stream received at In port 512.

Please replace paragraph [0048] with the following amended paragraph:

[0048] Figure 5b illustrates another alternative embodiment of variable-reflective tunable optical filters in an OADM 502. OADM 502 comprises In port 512 to receive an input WDM data stream including a spectrum of wavelength channels; Express port 574

to output an express WDM data stream including the spectrum of wavelength channels; Add port 516 to receive an input WDM data stream including a plurality of wavelength channels; and Drop port 578 to output a WDM data stream including the plurality of wavelength channels. OADM 502 also comprises optical circulators 519, 520, 539, 540, 559, 560, 579 and 580. In each of interferometers 510, 530, 550 and 570, the reflective bands of optical waveguide gratings 511, 531, 551 and 571 may be independently tuned by wavelength/frequency adjustment circuits 513, 533, 553 and 573 respectively; and the phase of at least one of the two halves of each reflected wavelength channel can be adjusted by phase adjustment circuits 515, 535, 555 and 575 to interfere with each other at couplers 517, 537, 557 and 575 respectively. As in OADM 501, the ouput WDM data stream from optical circulator 519 is routed to In port 532 of optical circulators 539, the ouput WDM data stream from optical circulator 539 is routed to In port 552 of optical circulators 559 and the ouput WDM data stream from optical circulator 559 is routed to In port 572 of optical circulators 579. In OADM 502, the ouput WDM data stream from optical circulator 520 is also routed to Add port 536 of optical circulators 540, the ouput WDM data stream from optical circulator 540 is routed to Add port 556 of optical circulators 560 and the ouput WDM data stream from optical circulator 560 is routed to Add port 576 of optical circulators 580. Thus the variable-reflective tunable optical filters are connected serially to provide hitless tunable adding/dropping of four wavelength channels to/from the WDM data stream received at In port 512 from/to the WDM data stream received at Add port 516.